

# Navigating The US DOE's Packaged CHP System eCatalog

US DOE Combined Heat and Power Technical  
Assistance Partnerships – Northwest CHP TAP

July 16<sup>th</sup>, 2020

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**CHP Technical Assistance Partnerships**  
NORTHWEST

# Our Webinar Today

- Gathering and Intro by NW CHP TAP
- Richard Sweetser - Packaged CHP slides and Live eCatalog demo
- Nolan Hill – Case Study brief
- Greg Porter – Case Study brief
- General Q/A and Wrap Up



# CHP Technical Assistance Partnerships (CHP TAPs)

## ○ End User Engagement

Partner with strategic End Users to advance technical solutions using CHP as a cost effective and resilient way to ensure American competitiveness, utilize local fuels, and enhance energy security. CHP TAPs offer fact-based, non-biased engineering support to manufacturing, commercial, institutional and federal facilities and campuses.

## ○ Stakeholder Engagement

Engage with strategic Stakeholders, including regulators, utilities, and policy makers, to identify and reduce the barriers to using CHP to advance regional efficiency, promote energy independence, and enhance the nation's resilient grid. CHP TAPs provide fact-based, non-biased education to advance sound CHP programs and policies.

## ○ Technical Services

As leading experts in CHP (as well as microgrids, waste heat to power, and district energy) the CHP TAPs work with sites to screen for CHP opportunities as well as provide advanced services to maximize the economic impact and reduce the risk of CHP from initial CHP screening to installation.



National Manufacturing Day 2019 at the  
University of Illinois at Chicago



# DOE CHP Technical Assistance Partnerships (CHP TAPs)

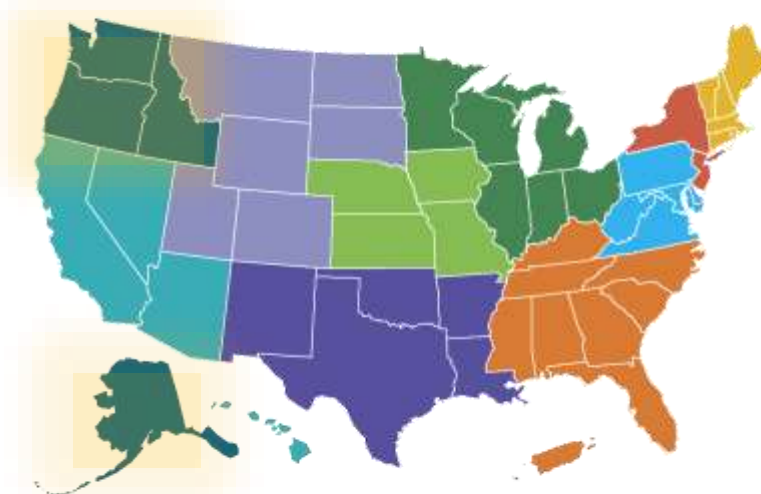
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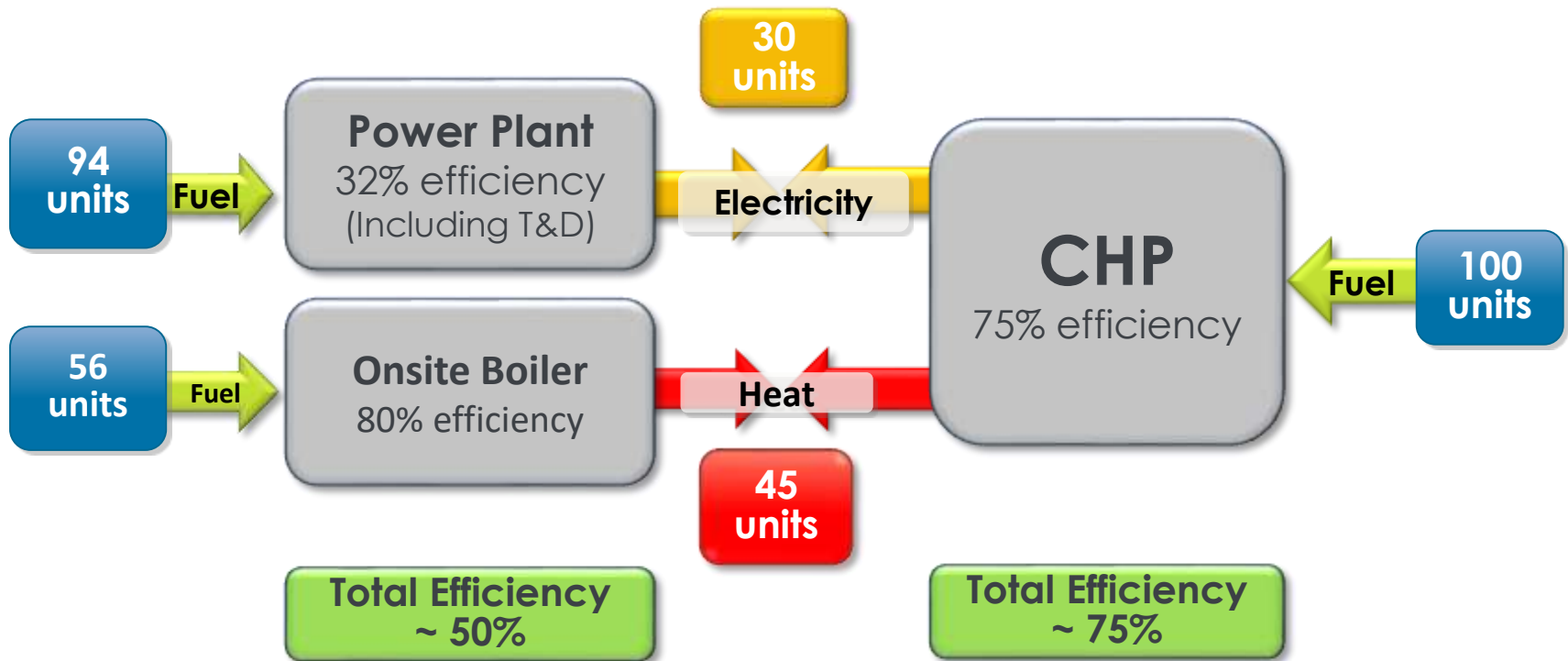
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# Why Are We Here? CHP Essential Concept:

Recapture Heat of Power Generation, Increasing Net Energy Efficiency - So Reducing, Fuel Use, Costs, GHGs



# Rich Sweetser / DOE CHP TAP HQ



## Packaged CHP Systems



## Navigating the U.S. DOE'S Packaged CHP System eCatalog with the Northwest CHP TAP

Richard Sweetser, President - Exergy Partners Corp.  
Packaged CHP Systems eCatalog Coordinator

July 16, 2020

# eCatalog Briefing Outline

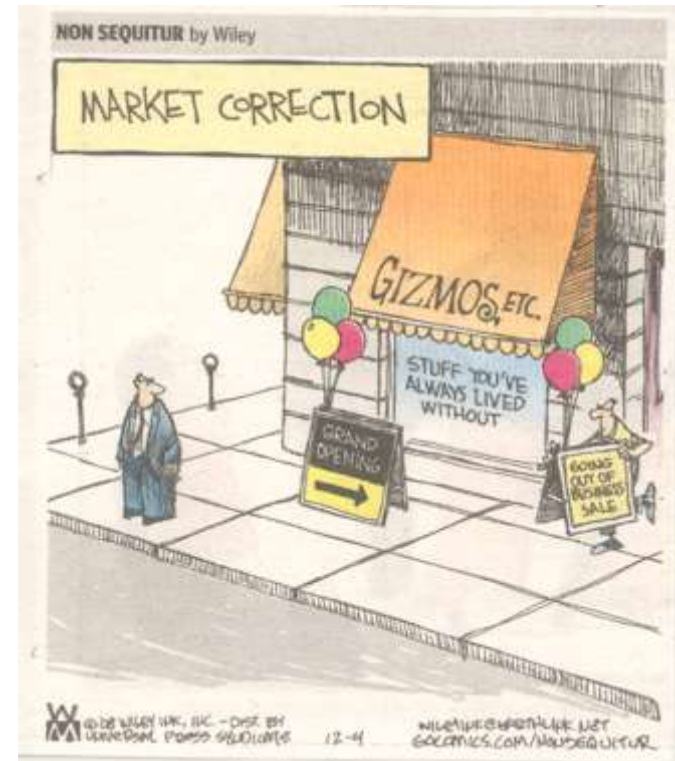
Reducing Risk with Recognized Packaged  
CHP Systems in the DOE eCatalog

- eCatalog Background
- eCatalog Definitions
- eCatalog Demo



# Packaged CHP Market Challenges

- CHP viewed as a discretionary purchase
- Lack of user awareness / understanding
- Under-developed sales and service infrastructure
- Every installation is considered unique
- High soft costs
- End-user responsibility



# NYSERDA's Packaged CHP Catalog

- NYSERDA Packaged CHP Catalog - Reduce perceived risk of installing and operating CHP by offering comparable standardization of CHP systems and field service agreements.



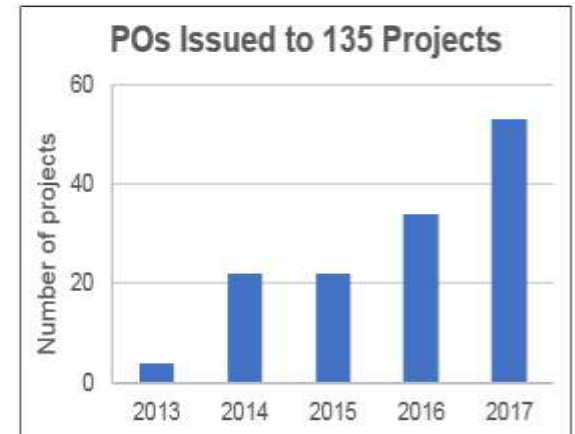
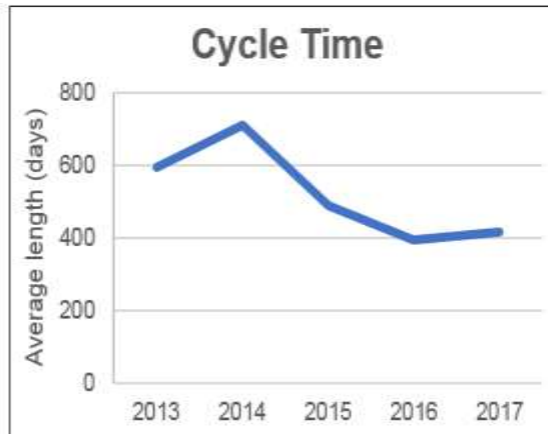
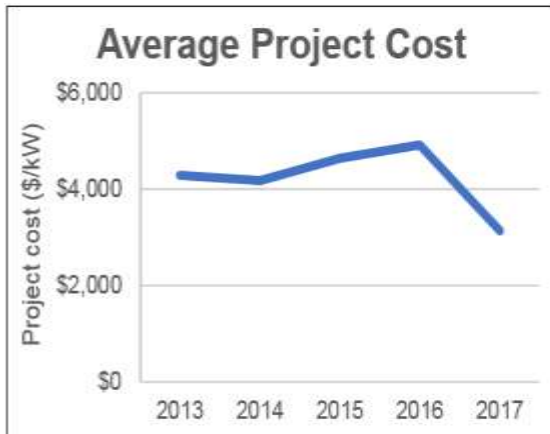
Source: NYSEDA CHP Catalog

- v1: 8 Vendors & 36 systems
- v2: 10 Vendors & 64 systems
- v3: 13 Vendors & 141 systems
- v4: 22 Vendors & 219 systems
- V5: 26 Vendors & 253 systems

- Independent endorsement based on in-depth analytical review
- Single-point-responsibility as the basis for customer-vendor relationship
- Comparison shopping to promote competition and expand offerings

# NYSERDA CHP Program Successes

- Commoditization of offerings and expansion of options
- Project cost reductions and time compression
- Increased program uptake
- Less dependent on subsidies (incentives ramping down over time)



# Robust Market Engagement Was Key to Success

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- **Public events** – Opportunities to provide introductions to CHP and connect end users with suppliers
- **Education** – Personalized understanding of technology and value proposition to specific business
- **Pre-screening** – High-level review of specific costs and benefits offered by CHP
- **Technical assistance** along project development path
- **Concierge to access financing, navigate permitting, identify supporting resources**

# Public Events - Talk and Tour

- **Introduction** to CHP technology
- Opportunity to **view successful CHP** installation – seeing is believing
- **Engage with current CHP end-users other customers**
- **Learn** about the **CHP project process**
- **Connect with suppliers**



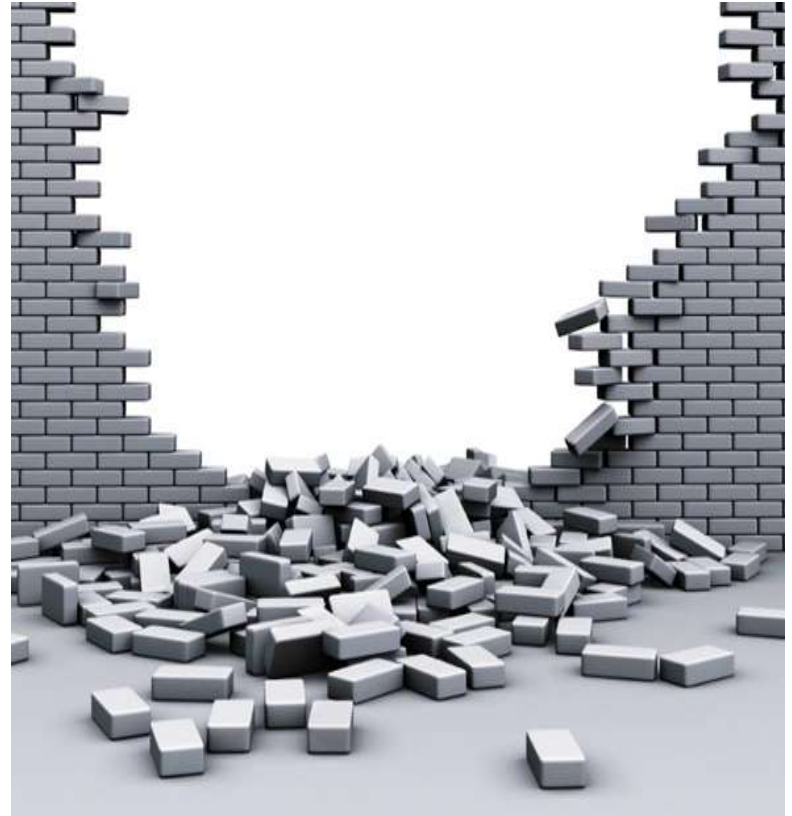
# Education and Outreach

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- **Address common misperceptions** on CHP technology
- **Engagement with decision makers** at all levels of organization
  - Facility managers, sustainability coordinators, C-suite, and everything in between
- **Identification of a project champion** within the organization
- **Providing clear and actionable information** to customers
- **Early-stage screening** to discover any CHP show-stoppers

# Ongoing Technical Assistance Was Critical

- Many projects stall at the vendor bid solicitation and selection process
- Proposals come in all different shapes and sizes
- Lack of meaningful and accurate data for customers to make a decision
- **Once customers lose interest, the project usually doesn't get revived**



# Why Packaged CHP Systems

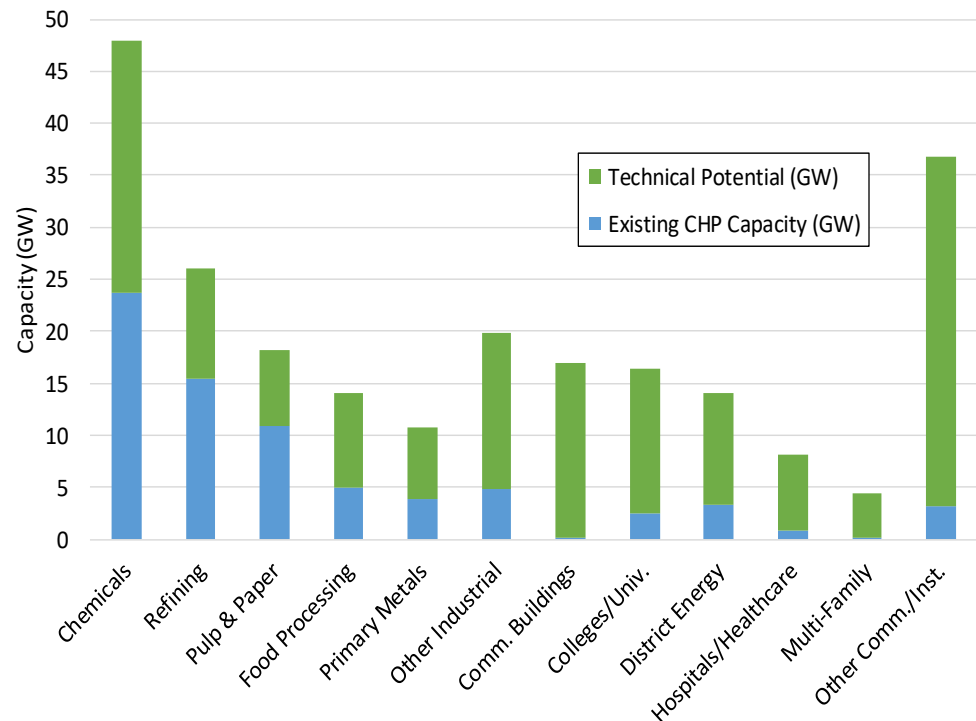
# Energy/CHP Market Trends

- Non-traditional Applications
- Resilience
- Complete Solutions
- Flexible Financing Solutions
- No Touch Solutions
- Carbon Reduction
- Low Risk



# Non-Traditional CHP Markets Are Growing

- Large CHP potential in commercial, institutional, light manufacturing, government and military applications
- Markets utilize smaller systems (< 10 MW) Markets have limited CHP experience
- Users have limited technical resources
- History of issues with system performance and with CHP sales and service support
- Many perceived risks by both users and suppliers



*Non-traditional markets represented 35% of the capacity and 70% of the projects installed since 2008*

# Packaged CHP Market

## Technical Potential Served by CHP Challenge – 70% of Total

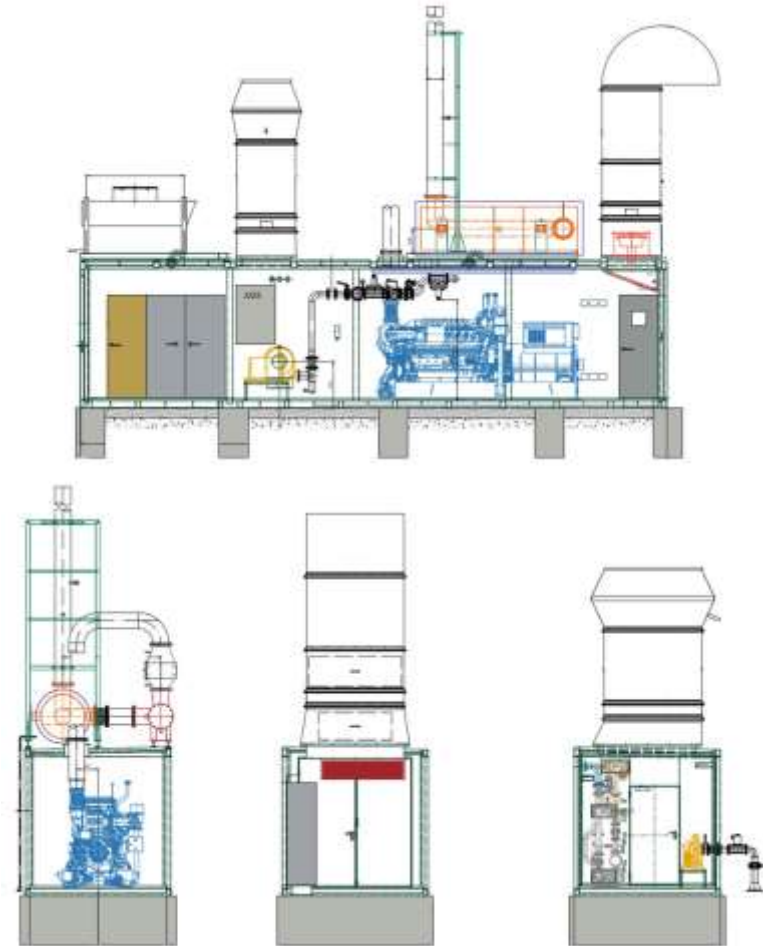
Application	50- <500 kW (MW)	500 kW- <1 MW (MW)	1- <5 MW (MW)	5- <10 MW (MW)	10 - <20 MW (MW)	≥20 MW (MW)	Total MW
Industrial	6,281	4,341	15,567	9,064	7,971	22,157	65,381
Commercial	20,068	18,100	20,284	5,504	3,948	8,026	75,930
Total	26,349	22,441	35,851	14,568	11,919	30,183	141,311

Source: US DOE CHP Technical Potential in the US, March 2016

99,200 MW of technical potential <10 MW

# Packaged CHP System Are Standard Repeatable Designs Including:

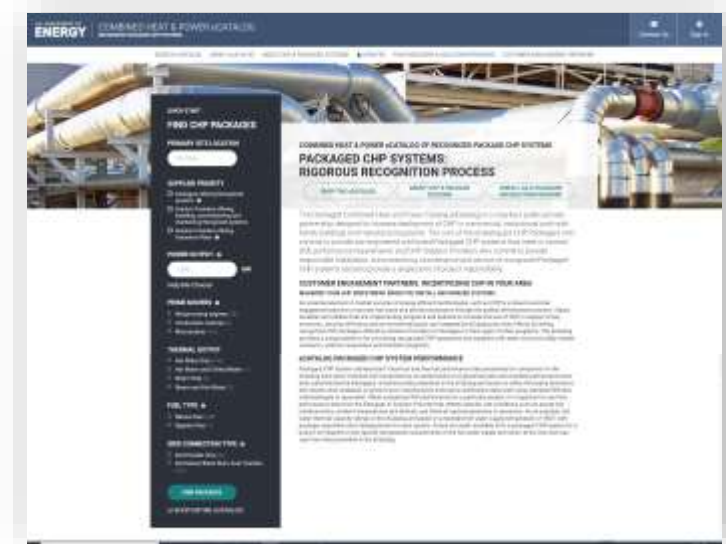
- 100% pre-wired
- 100% pre-piped with customer ready connection
- Properly ventilated
- Sound insulated
- Fire rated
- With a gas detection and smoke alarm
- Fluid containment system
- Auxiliaries sized appropriately and shipped complete with connecting piping and wiring
- Packagers have bulk purchasing power that local contractors do not have



# The Packaged CHP Systems eCatalog

# DOE Packaged CHP eCatalog

- A national web-based searchable catalog (eCatalog) of **DOE-recognized packaged CHP systems and suppliers** with the goal to reduce risks for end-users and vendors through partnerships with:
  - **CHP Packagers** that assemble and support recognized Packaged CHP Systems
  - **Solution Providers** that install, commission and service packaged CHP systems
  - **CHP Engagement partners** that provide CHP market programs at the state, local and utility level
- **Pre-engineered and tested packaged CHP systems that meet DOE performance requirements**
- **End-users and design engineers search** for applicable CHP system characteristics, and get connected to packagers, installers and CHP engagement programs
- Allows users to **compare technology options on a common basis**



<https://chp.ecatalog.lbl.gov/>

# Packaged CHP eCatalog Status

- Launched Nov 8, 2019
- 31 recognized Packagers
- 20 recognized Solution Providers
- 214 Package Offerings
  - 131 reciprocating engine
  - 82 microturbine
  - 1 gas turbine
  - 206 natural gas
  - 8 digester gas
  - 57 grid parallel only
  - 145 grid islandable/auto transfer
  - 24 kW to 7.5 MW
  - Multiple suppliers and packages in every zip code
- 9 Customer Engagement Partners

The screenshot displays the Packaged CHP eCatalog interface. On the left, a sidebar titled 'FOCUS YOUR RESULTS' contains various filters: 'PRIMARY SITE LOCATION' (set to Somerset, NJ), 'SUPPLIER PRIORITY' (listing various roles like Packager offering, Reciprocating engine, etc.), 'CUSTOMER ENGAGEMENT PARTNER' (listing program-specific partners), 'POWER OUTPUT (kW)' (with a range of 10 to 5000), 'PRIME MOVERS' (listing Reciprocating engines, Gas turbines, etc.), 'THERMAL OUTPUTS' (listing Hot Water Only, etc.), 'FUEL TYPE' (listing Natural Gas, Digester Gas), 'GRID CONNECTION TYPE' (listing Grid Parallel Only, etc.), and 'OUTDOOR INSTALLATION' (listing Required). The main area shows 'DISPLAYING: 187 Packages ordered by Relevance'. It features a grid of product cards, each with an image, a title (e.g., '26', 'ECL', 'ECONOM 9 BSB 1.1 kW'), a power output (e.g., '1,588 kW', '800 kW', '835 kW'), and a list of features and specifications. The interface is clean and professional, with a clear navigation structure.

<https://chp.ecatalog.lbl.gov/>

# eCatalog Live Demo



# Nolan Hill – Highland West Energy



# Highland West Energy

- Over 7 years of experience in the application, design, operation and support of Packaged CHP Systems.
- Our systems are installed in hospitals, hotels, recreation centers, municipal water parks, wastewater treatment plants, and apartment complexes.
- Highland West Energy:
  - offers turnkey CHP solutions and products.
  - has experience with 2G Energy, Yanmar, EC Power, and Lochinvar systems.
  - currently offers packaged CHP systems that range from 35 kW to 2 MW for commercial and industrial applications.



# Treasure Valley YMCA

- Boise, ID
- Two Yanmar CP35 kW packaged CHP systems
- 7-year lease/purchase agreement with an immediate positive cash flow of \$1,000 to \$2,000 per month.
- Meets 16% of thermal loads and 33% of site electrical loads
- 95% thermal efficient
- Domestic Hot Water for Showers
- Quiet Operation: 56 dB9A) @ 3 ft.



# Treasure Valley YMCA



See the US DOE CHP TAP Project Profile at: [https://chptap.lbl.gov/profile/240/TreasureValleyYMCA-Project\\_Profile.pdf](https://chptap.lbl.gov/profile/240/TreasureValleyYMCA-Project_Profile.pdf)

# Missoula Waste Water Treatment

- Missoula, MT
- 220 kW
- In operation since June of 2018
- Biogas/Natural Gas Blend currently running 100% on Biogas
- 100% back up power reliable
- Waste heat (hot water) is used to heat the digester to improve the process
- Electricity is used 100% at facility
- 1,620,600 kW in annual electricity savings
- 1,146 metric tons of annual CO<sub>2</sub> reduction – equivalent to removing 243 cars from the roads
- 400 tons of waste recycled instead of landfilled



# Greg Porter – Arctic Energy





**Arctic Energy**

AUTHORIZED CAPSTONE  
DISTRIBUTOR



# Combined Heat & Power/Distributed Generation in Alaska- What's here, What's coming

Greg Porter President, Arctic Energy, Inc.

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**Reliable power when and where you need it.  
Clean and simple.**



## **CHP/DG in Alaska has taken a giant leap in the last 5 years.**

- Off Grid growth and expansion
- EPA emissions standards
- Energy costs requiring CHP solutions
- Lack of Statewide infrastructure
- Smaller operations/Maintenance workforce requires higher reliability from power generation.

# Where we were

- 90% Oil & Gas applications
- Military applications



# Where we are today



**Alaska has seen many new CHP application segments in the last 18 months**

- Hospitality
- Healthcare
- Restaurant
- Manufacturing
- Office Buildings
- Houses of Worship

# Hospitality

## Hyatt Place Hotel, Anchorage, Alaska



# Healthcare

## 4050 Lake Otis Professional & Medical Center



# Restaurant

## Whiskey & Ramen



# Manufacturing

## Alaska Glacier Products



# Office Building

## Alutiiq Center- Anchorage



# Where we are headed



- Larger CHP applications- primarily in Healthcare
- Larger Oil & Gas Applications- Both existing infrastructure and new exploration
- More Hospitality-both new construction and retrofit
- National Science Foundation
- Agricultural



# Thanks!

[www.arcticenergyalaska.com](http://www.arcticenergyalaska.com)





# Questions and Discussion



# Summary

- CHP gets the most out of a fuel source, enabling
  - High overall utilization efficiencies
  - Reduced environmental footprint
  - Reduced operating costs
- CHP can be used in different strategies, including critical infrastructure resiliency and emergency planning
- Proven technologies are commercially available and cover a full range of sizes and applications



# Next Steps

## **Contact us at Northwest CHP TAP for no-charge assistance:**

- To learn more about CHP and our services
- To have an unbiased assessment of technical and economic opportunity for CHP at your site with no commitment and minimal effort
- If you have an existing CHP plant and are interested in expanding or improving it
- Need an unbiased 3rd Party Review of a proposal



# Thank You!

## US Department of Energy Northwest CHP TAP

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